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Some Chilopods of the Hidaka Mountain Range in Hokkaido, Northern Japan

By

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篠原圭三郎*：北海道日高山系の唇脚類

The arthropod fauna of Hokkaido, the northernmost mainland of Japan, is a subject of deep interest in zoogeographic point of view. Our knowledge of Chilopoda in this area is, however, insufficient, only a few papers having been published in this regard. TAKAKUWA (1940, 1942) reported 22 species in total of chilopods from Hokkaido, 15 species of Geophilomorpha, 1 species of Scolopendromorpha and 6 species of Lithobiomorpha. Later on, SHINOHARA (1957, 1968) added to the fauna one species each of Lithobiomorpha and Scutigeromorpha.

In the summer of 1971, Dr. Jun-ichi AOKI, a member of the research party organized by the Natural History Research Project of the National Science Museum, Tokyo, brought the author some chilopods from the Hidaka Mountain Range, where no survey has been made as to the chilopod fauna. They include several small species belonging to the orders Geophilomorpha and Lithobiomorpha, and a close examination of them revealed that two species among them are new to science. The specimens examined including the holotypes will be deposited in the Department of Zoology, National Science Museum, Tokyo. Some of the paratypes, duplicate and larval specimens are retained in the author's collection.

Before going further, the author wishes to express his hearty thanks to Dr. AOKI of the Department of Zoology, National Science Museum, Tokyo, for collecting and presenting the author these interesting material. He is also greatly indebted to Dr. Shun-Ichi UÉNO of the same department for his constant and valuable advice.

Order GEOPHILOMORPHA

Family Schendylidae

Escaryus japonicus ATTEMS

Escaryus japonicus ATTEMS, 1927, Zool. Anz., 72: 299.——TAKAKUWA, 1935, Zool. Mag., Tokyo, 47: 408; 1940, Fauna Nipponica, Tokyo, 9 (8-1): 35.

1♂: Mt. Poroshiri-dake, July 26, 1971.

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Distribution. Already known from Hokkaido, Sakhalin, Shansi, North China and Siberia. CHAMBERLIN and WANG (1952) reported this species from Aomori, northern Honshu, but in my opinion it is probably *E. igarashii.*

Escaryus sachalinus TAKAKUWA

Escaryus sachalinus TAKAKUWA, 1935, Zool. Mag., Tokyo, **47**: 409; 1935, Trans Sapporo nat. Hist. Soc., **14**: 48; 1940, Fauna Nipponica, Tokyo, **9** (8–1): 37.

1♂, 1♀: Poroshiri-sansô and Kita Cirque of Mt. Poroshiri-dake, July 24, 1971.

Notes. The male examined is provided with 37 pair and the female with 39 pair of legs. This species is known from Hokkaido, Sakhalin and Sanshi, North China.

Family Mecistocephalidae

Prolamnonyx dentatus TAKAKUWA

Prolamnonyx dentatus TAKAKUWA, 1934, Annot. zool. Japon., **14**: 359; 1940, Fauna Nipponica, Tokyo, **9** (8–1): 94.

4♂, 1 larva: Poroshiri-sansô at the foot of Mt. Poroshiri-dake, July 24, 1971.

Distribution. Known only from Hokkaido.

Tygarrup moiwaensis TAKAKUWA

Tygarrup moiwaensis TAKAKUWA, 1934, Annot. zool. Japon., **14**: 357; 1940, Fauna Nipponica, Tokyo, **9** (8–1): 84.
Tygarrup (*Partygarrupius*) *moiwaensis*: VERHOEFF, 1939, Zool. Jb., Syst., **72**: 87.

1♀, 1 larva: Poroshiri-sansô at the foot of Mt. Poroshiri-dake, July 24, 1971.

Distribution. The species has been known only from the type-locality, Mt. Moiwa-yama, south of Sapporo.

Family Geophilidae

Brachygeophilus dentatus TAKAKUWA

Brachygeophilus dentatus TAKAKUWA, 1936, Zool. Mag., Tokyo, **48**: 278; 1936, Trans. Sapporo nat. Hist. Soc., **14**: 143; 1940, Fauna Nipponica, Tokyo, **9** (8–1): 111.

1♂: Poroshiri-sansô at the foot of Mt. Poroshiri-dake, July 27, 1971.

Distribution. Known from Hokkaido only.

Scolioplanes acuminatus LEACH

Geophilus acuminatus LEACH, 1815, Trans. Linn. Soc. Lond., **11**: 386.
Scolioplanes acuminatus: BERGSOE & MEINERT, 1866, Naturh. Tidsskr., (3), **4**: 101.——ATTEMS, 1929,

Geophilomorpha, Das Tierreich, 222.——TAKAKUWA, 1933, Bull. biogeogr. Soc. Japan, 4: 133; 1940, Fauna Nipponica, Tokyo, 9 (8–1): 124.

1♂, 1♀: Poroshiri-sansô at the foot of Mt. Poroshiri-dake, July 27, 1971.

Notes. Both the male and the female have 41 pair of legs. The species has a wide distribution in Europe, Siberia, Chishima (Kurile) Islands, Behring Islands and Alaska.

Order LITHOBIOMORPHA

Family Lithobiidae

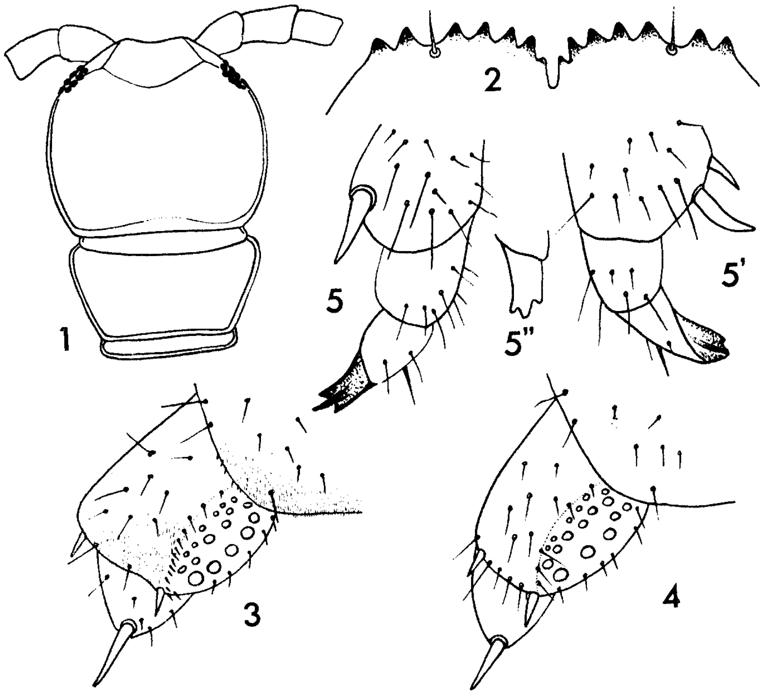
Bothropolys ogurii MIYOSI

(Figs. 1–5)

Bothropolys ogurii MIYOSI, 1955, Zool. Mag., Tokyo, 64: 257.

1♂, 2♀ : Dam-side at the western foot of Mt. Poroshiri-dake, July 30, 1971.

Description. Body length 16–18 mm. General colour deep brown, but the legs are lighter in colour than the body. Ocelli about 25 in number, being arranged in 4 series. Tömösvary's organ larger than a single ocellus. Antennae with 20 articles. Coxosternal teeth 7–8, well chitinized and arranged in an arc on each side as shown in Fig. 2; an accessory spine situated between the second and the third or the third and the fourth teeth. The first



Figs. 1–5. *Bothropolys ogurii* MIYOSI.——1. Head and the first tergite (dorsal view).——2. Coxosternal teeth.——3. Coxa of 14th leg and ecto-posterior side of 14th sternite in male.——4. Coxa of 14th leg and ecto-posterior side of 14th sternite in female.——5 and 5'. Female gonopods.——5". Claw of female gonopod.

dorsal plate trapezoid, the anterior margin being longer than the posterior one. The posterior angles of dorsal plates processed in the ninth, eleventh and thirteenth tergites. The last four pair of legs with 15–20 pores on each coxa. Plectrotaxy of legs is shown in Table 1.

Table 1. The plectrotaxy of legs of *Bothropolys ogurii* MIYOSI.

No. of legs	Dorsal					Ventral				
	C	Tr	P	F	Ti	C	Tr	P	F	Ti
1			amp	ap	a			mp	amp	am
2			amp	ap	ap			mp	amp	am
3			amp	ap	ap			mp	amp	am
4			amp	ap	ap			mp	amp	am
5			amp	ap	ap			mp	amp	am
6			amp	ap	ap			mp	amp	am
7			amp	ap	ap			mp	amp	am
8			amp	ap	ap			mp	amp	am
9			amp	ap	ap			mp	amp	am
10			amp	ap	ap			amp	amp	am
11			amp	ap	ap			amp	amp	am
12	a		amp	ap	ap		m	amp	amp	am
13	a		amp	ap	ap		m	amp	amp	am
14	a		amp	ap	ap	m	m	amp	amp	a
15	a		amp	p		m	m	amp	am	a

Coxae of the penultimate and the last legs with a lateral spine. Males have many ciliary hairs on the ecto-ventral surface of coxae of penultimate legs, but females are lacking in such hairs. Claw of female gonopod weakly tripartite, the median tooth being longer than the lateral ones which are subequal in size to each other. Basal spines acute, 1+1 or 2+2.

Notes. This species was originally described by MIYOSI from a cave in Nagano Prefecture and we have had no additional record up to the present time.

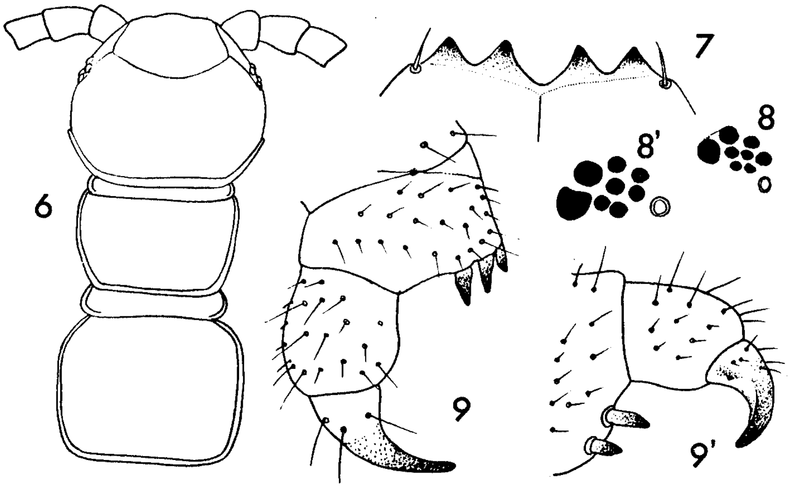
Lithobius (Archilithobius) aokii sp. nov.

(Figs. 6–9)

Diagnosis. The present species is very similar to *L.* (*A.*) *otasanus* TAKAKUWA known from Sakhalin, but the new species differs distinctly from the latter in the plectrotaxy of legs, especially in the arrangement of plectra on the penultimate and ultimate legs.

Description. General colour deep brown. Body length about 15 mm, width 1.8 mm. Body conspicuously narrowed cephalad and caudad from 8th–10th dorsal plates. In the holotype, the proportions of width of head to 1st, 3rd, 5th, 8th, 10th, 12th, 14th and the last dorsal plates are : 0.9, 1.0, 1.1, 1.2, 1.2, 1.1, 1.0 and 0.8. Head plate slightly wider than long (8 : 7 in ratio). Antennae with about twenty articles. Ocelli about 6–8; the posteriormost ocellus large. Prosternal teeth 2+2, acute, subequal in length to each other and the median sinus widely V-shaped. None of the dorsal plates with projecting posterior angles. Plectrotaxy of legs is shown in Table 2. Coxal pores round, 3–5, 4–5, 4–5, 3–5. Claw of female gonopods entire, the basal spines 3 + 3 or 3 + 2, stout and subconical, the paired spines being fairly remote from each other; the outer spine longer and thicker than the inner one.

Type-series. Holotype (NSMT–Ch 1): Female, Poroshiri-sansô at the foot of Mt. Poroshiri-dake, Hidaka Mountain Range, Hokkaido, northern Japan. July 24, 1971.



Figs. 6–9. *Lithobius* (*Archilithobius*) *aokii* sp. nov.——6. Head and some successive tergites.——7. Coxosternal teeth.——8 and 8′. Ocelli.——9 and 9′. Female gonopods.

Table 2. The plectrotaxy of *Lithobius* (*Archilithobius*) *aokii* sp. nov.

No. of legs	Dorsal					Ventral				
	C	Tr	P	F	Ti	C	Tr	P	F	Ti
1			p	a	a			p	am	m
2			p	ap	a			p	am	am
3			ap	ap	a			p	am	am
4			ap	ap	ap			mp	am	am
5			ap	ap	ap			mp	am	am
6			ap	ap	ap			mp	am	am
7			ap	ap	ap			mp	am	am
8			ap	ap	ap			mp	am	am
9			ap	ap	ap			mp	am	am
10			ap	ap	ap			mp	am(p)	am
11			ap	ap	ap			mp	amp	am
12			ap	ap	ap			mp	amp	am
13			amp	ap	ap			amp	amp	am
14			amp	ap	ap		m	amp	amp	am
15			amp	p			m	amp	am(p)	(a)m

J. AOKI. Paratypes: 1♂, 2♀, the same locality as the holotype, but the collecting dates are: July 23, 24 and 27, 1971. Seven larval specimens were collected at the same time.

Lithobius (Archilithobius) sp.

1♂, Mt. Poroshiri-dake, July 27, 1971.

Monotarsobius crassipes holstii POCOCK

Lithobius (*Archilithobius*) *holstii* POCOCK, 1895, Ann. Mag. nat. Hist., (6), **15**: 348.
Monotarsobius takakuwai VERHOEFF, 1937, Arch. Natg., (N. F.), **6**: 193.
Monotarsobius crassipes Holstii: TAKAKUWA, 1941, Trans. nat. Hist. Soc. Formosa, **31**: 292; 1942, Fauna Nipponica, Tokyo, **9** (8–3): 78.
Monotarsobius crassipes holstii: CHAMBERLIN & WANG, 1952, Proc. biol. Soc. Wash., **65**: 183.

11♂, 5♀, 8 larvae, Mt. Poroshiri-dake, July 24–27, 1971.

Distribution. Widely distributed in Northeast Asia, Siberia, North China, Japan and Formosa.

Monotarsobius spp.

1♀, Poroshiri-sansô at the foot of Mt. Poroshiri-dake, July 27, 1971. 1♂, Mt. Poroshiri-dake, July 26, 1971.

Nampabius japonicus sp. nov.

(Figs. 10–14)

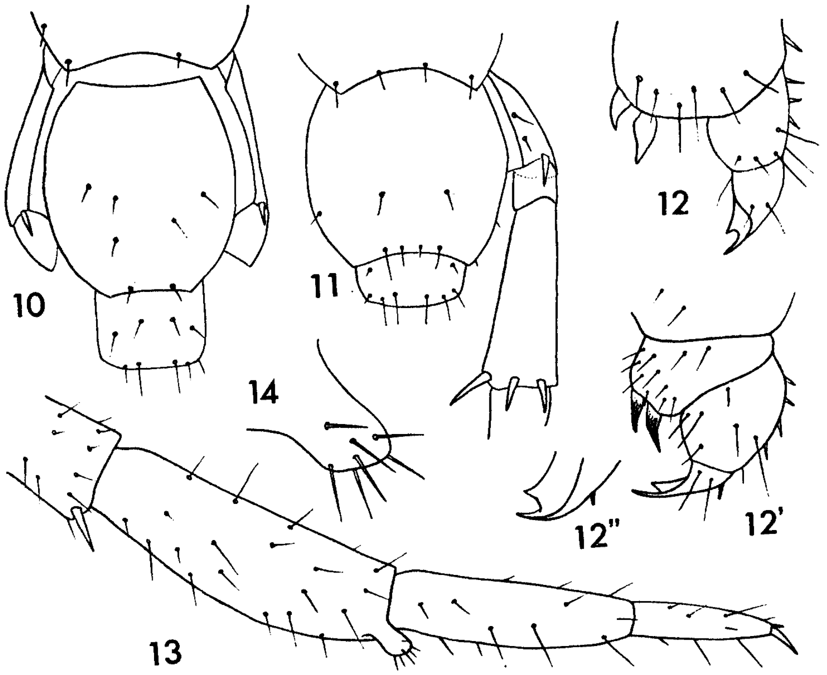
Body length about 7–9 mm. Body conspicuously narrowed cephalad from 10th abdominal somite. General colour light brown, but the head and antennae are deep brown. Head plate subpentagonal. Antennae consisting of about 20 articles, of which the basal two are large. Ocelli 5–10. Prosternal teeth 2+2, acute, subequal in size; median sinus V-shaped. All tergites not projecting in posterior angles. Tarsi of legs undivided. Plectrotaxy of legs as shown in Table 3. Coxal pores of male: 2, 3, 3, 3; 3, 3, 3, 2; 3, 5, 4, 3; those of female: 3, 3, 3, 3; 3, 4, 4, 4. Claw of gonopod in female usually bipartite, the exterior tooth being longer than the interior one. Gonopod provided on the dorsal side with a series of several spines. Basal spines 2+2, stout, acute. Posterior margin of the last dorsal plate straight in male, but concave in female. As the secondary sexual character, male has a process of tibia of penultimate legs; the process small, with several setae and situated at the dorsoposterior end of tibia. Ultimate legs having neither process nor sulcus.

Type-series. Holotype (NSMT-Ch 3): Male, Mt. Poroshiri-dake, Hidaka Mountain Range, Hokkaido, northern Japan, July 27, 1971, J. AOKI. Paratypes: 2♂, 2♀, the same data as the holotype.

Notes. According to ATTEMS (1926), the present form belongs to the genus *Nampabius*, because the secondary character of male is found on the tibia of penultimate legs. Later, however, the same author (1938) regarded *Nampabius* as a synonym of *Pokabius*, a subgenus

Table 3. The plectrotaxy of legs of *Nampabius japonicus* sp. nov.

No. of legs	Dorsal					Ventral				
	C	Tr	P	F	Ti	C	Tr	P	F	Ti
1			p	a				(p)	m	m
2			p	ap	a			(p)	m	m
3			p	ap	ap			(p)	m	m
4			p	ap	ap			(p)	(a)m	m
5			p	ap	ap			(p)	(a)m	m
6			(a)p	ap	ap			(p)	am	m
7			(a)p	ap	ap			(p)	am	am
8			ap	ap	ap			(m)p	am	am
9			ap	ap	ap			mp	am	am
10			ap	ap	ap			mp	am	am
11			amp	ap	ap			mp	amp	am
12			amp	p	ap			mp	amp	am
13	a		amp	p	ap			(a)mp	amp	am
14	a		amp	p			m	(a)mp	amp	am
15	a		amp	p			m	amp	am	



Figs. 10–14. *Nampabius japonicus* sp. nov.——10. The 15th and anal tergites in male.——11. The 15th and anal tergites in female.——12 and 12'. Female gonopods (lateral view).——12". Claw of female gonopod.——13. The right penultimate leg of male (dorsal view).——14. Process of tibia of male penultimate leg.

of the genus *Lithobius*. The tarsi of legs are divided in *Lithobius*, but they are single in *Nampabius* as well as in *Monotarsobius*. This is the reason why the author treats the new species as a member of the genus *Nampabius*. The genus has hitherto been known from North America, Siberia and Central Asia, and the present finding of *Nampabius japonicus* is the first record of the genus from Japan.

要約

北海道の唇脚類は，現在までのところ高桑（1940, 1942）および篠原（1957, 1968）により，ゲジ類1種，イシムカデ類6種，アカムカデ類1種およびジムカデ類15種の合計24種が既知であった．それら既知種からみて，南西部の渡島半島は他の北海道主部とは唇脚類相において異なるように思われるが，それらは今後の研究にまつほかはない．唇脚類は今回調査の対象となった日高山系からまったく知られていなかった．本報告には日高山系の最高峯，幌尻岳（海抜 2,052 m）の山頂付近および山麓において採集された唇脚類の同定結果ならびに2新種の記載を含んでいる．

幌尻岳から採集された種は次のとおりである．

1) ニホンエスカリジムカデ *Escaryus japonicus* ATTEMS
2) カラフトエスカリジムカデ *Escaryus sachalinus* TAKAKUWA
3) シミヅメジムカデ *Prolamnonyx dentatus* TAKAKUWA
4) モイワジムカデ *Tygarrup moiwaensis* TAKAKUWA
5) スミジムカデ *Brachygeophilus dentatus* TAKAKUWA
6) キタスコリジムカデ *Scolioplanes acuminatus* LEACH
7) オグリイッスンムカデ *Bothropolys ogurii* MIYOSI
8) アオキイシムカデ（新称） *Lithobius* (*Archilithobius*) *aokii* sp. nov.
9) *Lithobius* (*Archilithobius*) sp.
10) ホルストヒトフシムカデ *Monotarsobius crassipes holstii* POCOCK
11) *Monotarsobius* spp.
12) コブイシムカデ（新称） *Nampabius japonicus* sp. nov.

以上12種のうち 1)〜6) のジムカデ類についてみれば，本州に分布するものは1種もなく，*E. japonicus*, *E. sachalinus* および *S. acuminatus* はシベリア大陸と共通の種であり，日高山地のジムカデ相が大陸と類縁関係が深い証拠となる．7)〜12) のイシムカデ類では，*Bothropolys ogurii* は本州の長野県の洞窟から記載されたものであるが，今回第2の産地として日高が知られたわけで寒地系の種と思われる．特記すべきことは *Nampabius*（コブイシムカデ属，新称）に属する種が得られたことである．この属は *Monotarsobius* や，*Pokabius* などに近い形態で，雄の第14歩肢の脛節末端に2次性徴としての円筒形の突起をもつことで区別されている．従来北アメリカ大陸から数種が知られているほか，シベリアやコーカサスにも分布している．このような属の種が北海道日高の幌尻岳から得られたことは，北海道が動物地理学的に北アメリカ，シベリアからコーカサスに及ぶ全北区系のうちの一地域を構成する証拠であり，ジムカデ目とともにイシムカデ目においても，明確に北海道が本州とは異なる種類組成をもっていることを示しているものと思われ，はなはだ興味ぶかい．

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